

# Comparison of Three Methods of Entering Clinical Information in a Prototype Triage System

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## Abstract

*This research study is a prospective, randomized trial evaluating varied means of inputting structured clinical data into a prototype triage system. Three different methods of historical data entry were evaluated for efficiency, quality of obtained data and ease of use. The results show that using a "customized" form containing check-box entries for only the most commonly seen historical data and space for text entry of other information was the most accurate method of entering triage information and was nearly as fast and easy as free text entry*

## Introduction

One specific technological hurdle that clinical information systems face is that an efficient and user-friendly method of historical patient data acquisition has yet to be widely accepted. Data entry has traditionally been achieved through painstaking keyboard entry of free text by providers at the point of care. This method, however, is often time consuming and generally provides unstructured, unqualified data. Mouse driven entry of data via the use of checkboxes or pull down menus provides more valuable, highly structured data, but is considered cumbersome. Little has been recorded in the literature regarding the evaluation of methods of data acquisition and a randomized prospective study comparing methods of data entry by healthcare providers has yet to be reported.

## Methods

The study was conducted in the efficiency demanding setting of a busy urban Emergency Department (ED) using three custom-designed web-based computer entry modules, hereby named X, Y, and Z. These modules allowed for the input of a patient's a) past medical history, b) medications, and c) allergies, as would typically be entered by a triage nurse upon the patient's arrival in the ED. Module X consisted of extensive lists of options that could be checked to allow for data element entry. Module Y contained only text based entry fields for receipt of the data. Module Z was customized to contain "smart" lists, that is, lists of the most common elements found on a retrospective review of 100 charts of patients seen in that ED. Module Z also allowed for non-list entries via the use of "other" text entry fields. Eighteen triage providers (fourteen nurses, four physician assistants) were randomly chosen from a convenience sample.

They were briefly trained and then asked to use the aforementioned computerized modules to enter anonymous patient data for nine separate patient vignettes. Three vignettes were entered using each module, with the module order randomly predetermined. Upon completion, the participants were asked to fill out a survey evaluating the ease of use of each module as well as their technical and medical experience.

The modules were analyzed for efficiency by measuring the amount of time it took to enter the data, for quality of data obtained by analyzing the accuracy of the data, and for ease of use based upon the scores and remarks given by the participants on the post-study surveys.

## Results

Data collection took place over a period of two weeks. Each participant received five minutes of training and required an average of 21.8 minutes (SD 6.75) to complete the entry of historical data for all nine cases.

	Module X (Extensive)	Module Y (Free Text)	Module Z (Customized)
Mean Entry Time	3.6 min./case	1.7 min./case	1.9 min./case
Error Rate	.51 / case	.41 / case	.25 / case
Ease-of-Use Scale (1-10)	5.1	7.8	7.3

The average age of participants was 40.0 (SD 10.0) and 67% were females. There was a direct correlation between the age of the participant and the length of time required to enter the data ( $p = .57$ ) and an inverse correlation between participants' experience with the internet and time of entry ( $p = -.66$ ).

## Conclusion

Though this study was limited by its evaluation of short-term use in newly trained users, the results may have implications for the design of future triage systems. Free text entry was found to be the most rapid and easiest method of data entry. However, using a "customized" form containing a combination of common check-box entries and free text entry for "other" data was nearly as efficient and was more accurate.